

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Appellants: David R. Payne, Gerald A. Stangl,  
Norman E. Stevens, Jr., and Michael F. Gard

Group No.: 3671

Serial No.: 10/617,975

Examiner: Raymond W. Addie

Filed: July 12, 2003

Att'y Dkt. No. 2380-561

For: SYSTEM AND METHOD FOR  
AUTOMATICALLY DRILLING  
AND BACKREAMING A  
HORIZONTAL BORE  
UNDERGROUND

Date: June 5, 2006

**APPELLANTS' REPLY BRIEF**

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**I. STATUS OF CLAIMS**

Claims 1-3 are withdrawn.

Claims 4-12 are rejected and being appealed.

## **II. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

A. Are claims 4-12 unpatentable under 35 U.S.C. § 103(a) as rendered obvious by the combination of U.S. Patent No. 5,883,015, issued to Hesse et al. and U.S. Patent No. 6,308,787, issued to Alft?

B. Are claims 5-12 unpatentable under 35 U.S.C. § 103(a) as rendered obvious by the combination of U.S. Patent No. 5,883,015 issued to Hesse et al., U.S. Patent No. 6,308,787 issued to Alft and U.S. Patent No. 5,746,278 issued to Bischel et al., as incorporated by reference in Alft?

### III. ARGUMENT

#### A. The Examiner improperly presents a new ground of rejection in the Answer.

In response to Appellants' Appeal Brief the Examiner has improperly brought forth a new ground of rejection for claims 5-12. For the first time during the prosecution of this application, the Examiner turns to U.S. Patent No. 5,746,278 issued to Bischel et al. as providing disclosure and evidence of obviousness of the limitations in claims 5-12. See Answer at 10.

Any new ground of rejection made by an examiner in an answer must be (a) approved by a Technology Center Director or designee and (b) prominently identified in the "Grounds of Rejection to be Reviewed on Appeal" section and the "Grounds of Rejection" section of the answer. MPEP 1207.03(I). The Examiner's presentation of this new rejection based on the combination of Hesse, Alft and Bischel does not meet either of these requirements. Section 1207.03 states that a new prior art reference applied or cited for the first time in an examiner's answer generally will constitute a new ground of rejection. The MPEP further states that "even if the prior art reference is cited to support the rejection in a minor capacity, it should be positively included in the statement of rejection." MPEP 1207.03(III). The Examiner's reliance on Bischel for the first time in his Answer constitutes the improper application of a new prior art reference to claims 5-12. However, as discussed below the Examiner's effort to bolster his position by including a new reference does not cure the deficiencies of the obviousness rejection. The disclosure of Bischel is irrelevant to the present issue and does not supply the teachings missing from Alft.

#### B Claims 4-12 are patentable over the combination of Hesse and Alft.

The Examiner maintains the rejection of claims 4-12 under § 103(a), as being unpatentable over Hesse et al. (U.S. 5,833,015) in view of Alft (U.S. 6,308,787) on the premise that Appellants' claims do not require "the prior art to disclose or teach 'how' the automatic reduction of the drill string occurs." Appellants' claims do not require the prior art to teach how to automatically reduce a length of drill string, rather, to qualify as prior art the reference must

enable one skilled in the art to practice the claimed invention. In re Kumar, 418 F.3d 1361, 1368 (Fed. Cir. 2005). Alft does not provide such teachings and the combination of Hesse and Alft cannot support a *prima facie* showing of obviousness as to Appellants independent claim 4.

As will be discussed below, the Examiner's argument must fail because the combination of Hesse and Alft does not meet the standard established by the Federal Circuit Court of Appeals to establish obviousness under 35 U.S.C. § 103 (a). In the Answer to Appellants' Appeal Brief the Examiner agrees with Appellants' position that the Hesse reference does not teach or disclose automatically reducing a length of the drill string as required in Appellants' claim 4. However, the Examiner erroneously applies a non-enabling reference, Alft, to supply the missing feature of automatically reducing a length of drill string.

**1. The Examiner's rejection is contrary to Federal Circuit Law.**

To rebut a *prima facie* showing of obviousness the applicant may show the prior art reference does not enable one skilled in the art to produce the claimed invention. The Federal Circuit addressed this issue in an August 2005 case by holding: "[a]lthough published subject matter is 'prior art' for all that it discloses, in order to render an invention unpatentable for obviousness, the prior art must enable a person of ordinary skill to make and use the invention." In re Kumar, 418 F.3d at 1368; citing Beckman Instruments, Inc. v. LKB Produkter AB, 892 F.2d 1547, 1551, 13 U.S.P.Q.2d 1301, 1304 (Fed. Cir. 1989). In this case, the Alft reference does not enable one skilled in the art to make and use the invention. The Hesse patent does not disclose how to automatically reduce a length of the drill string, and the Alft patent does not provide sufficient teaching to fill-in the gaps left by Hesse. Thus, a case of obviousness as to claim 4 has not been made and the § 103(a) rejection must be overturned.

The Examiner attempts to rebut Appellants by admitting Alft teaches only "some" of the steps "necessary to reduce a length of drill string." See Examiner's Answer at 8. The steps referenced by the Examiner include Alft's system for make-up and break-out of pipe sections and a controller for altering thrust and pullback of the boring tool based on soil and rock load conditions.

**2. Alft's disclosure does not support the Examiner's position.**

As previously discussed in Section VII(iv)(A)(4) of Appellant's Appeal Brief, Alft's mere desire to automatically reduce a length of drill string does not make it enabling for such purpose and cannot render Appellants' claims obvious. Cardiac Pacemakers, Inc. v. St. Jude Medical, Inc., 381 F.3d 1371 (Fed. Cir. 2004) (recognition of a problem to be solved by a reference does not render the solution obvious). See Appeal Brief at 5-6. ). Alft describes only a rod loader unit used to control an automatic rod loader apparatus. However, Alft does not teach how to automatically reduce a length of drill string. In order to teach how to automatically reduce a length of drill string, Alft must teach or disclose sensors and/or control logic needed to process information from the sensors and activate the mechanical devices used to reduce a length of drill string. Alft does not teach or disclose this information.

The Examiner continues his argument by stating, for the first time, that the portion of Alft actually at issue is contained in column 30, lines 33-55. See Answer at 8. The Examiner's position is that Alft's discussion of automatic moderation of the operation of the boring machine under varying soil and rock loading conditions teaches one skilled in the art how to automatically reduce a length of drill string. With regard to controlling thrust and pullback of the boring tool, Alft states only:

The machine controller 74 also controls the rotation pump 146 during automatic threading of rods to the drill string. A pipe loading controller 141 may be employed to control an automatic rod loader apparatus during rod threading and unthreading operations. The machine controller 74 also controls a thrust/pullback pump or motor 144, referred to hereinafter as a thrust/pullback pump. The machine controller 74 controls the thrust/pullback pump 144 during boring and backreaming operations to moderate the forward and reverse displacement of the boring tool.

The thrust/pullback pump 144 depicted in FIG. 8 drives a hydraulic cylinder 154, or a hydraulic motor, which applies an axially directed force to a length of pipe 180 in either a forward or reverse axial direction. The thrust/pullback pump 144 provides varying levels of controlled force when thrusting a length of pipe

180 into the ground to create a borehole and when pulling back on the pipe length 180 when extracting the pipe 180 from the borehole during a back reaming operation. The rotation pump 146, which drives a rotation motor 164, provides varying levels of controlled rotation to a length of the pipe 180 as the pipe length 180 is thrust into a borehole when operating the boring machine in a drilling mode of operation, and for rotating the pipe length 180 when extracting the pipe 180 from the borehole when operating the boring machine in a back reaming mode. Sensors 152 and 162 monitor the pressure of the thrust/pullback pump 144 and rotation pump 146, respectively.

See Alft, col. 30, lines 33-55. As the above passage clearly shows, lines 33-55 are concerned with only moderation of the forward and reverse displacement of the boring tool based upon the pressure readings in the thrust/pullback pump and rotation pump. This thrust/pullback monitoring system functions to alter performance of the boring machine in response varying soil and rock load conditions and does not function as part of a system designed to automatically reduce a length of drill string. Accordingly, the Examiner has failed to show that Alft teaches how to automatically reduce a length of drill string because the Examiner cannot point to any text that discloses the sensors or control logic needed to process information from the sensors and activate the mechanical devices used to automatically reduce a length of drill string. Accordingly, the rejection of Appellants' independent claim 4 in view of Hesse in combination with Alft must fail. Claims 5-12 depend from claim 4 and include all of its limitations. Accordingly, the rejection of claims 5-12 must likewise fail.

**C. Claims 5-12 are patentable over the combination of Hesse, Alft, and Bischel.**

The Examiner rejected claims 5-12 under 35 U.S.C. § 103(a) as unpatentable over the combination of Hesse, Alft, and Bischel. Withdrawal of this rejection is respectfully requested.

Claims 5-12 depend either directly or indirectly from independent claim 4. Claim 4 has been shown to be patentable over the combination of Hesse and Alft because neither reference discloses automatically reducing a length of drill string as required by Appellants' claim 4. Bischel does not supply the missing feature.



Bischel is directed to a method and apparatus for controlling the rate at which drilling fluid is pumped into the borehole to remove cutting and debris generated by the boring tool. The system in Bischel uses a rotation pump control 52 to maintain optimum rotation of the boring tool during the boring operation. During drilling or backreaming operations a rotation pump sensor monitors the pressure of the rotation pump and communicates rotation pump pressure information to a controller. In response to the rotation pump pressure information, the controller sends a signal to a displacement pump to either increase or reduce the rate of boring tool displacement.

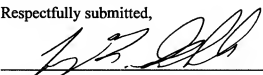
A drilling fluid pump 58 may also form part of the boring system. The controller monitors the rate at which drilling fluid is pumped through the borehole and automatically adjusts the rate of displacement and/or the liquid flow rate so that sufficient liquid is flowing through the borehole in response to changes in the pressure readings of the rotation and displacement pumps. See Bischel, col. 4, line 37 – col. 5, line 21 and Abstract. Thus, Bischel is directed to an apparatus and method for automatically altering operation parameters of the boring machine in response to soil and rock loading parameters. There is no disclosure or teaching in Bischel of sensors or control logic needed to process information from the sensors to activate mechanical devices used to reduce a length of drill string. Rather, Bischel simply teaches a system for controlling boring tool rotation and displacement and drilling fluid flow rate. Accordingly, independent claim 4 is patentable over the combination of Hesse, Alft and Bischel.

Claims 5-12 all depend directly or indirectly from claim 4 and they should be allowed when claim 4 is allowed. Each of these dependent claims includes the patentable features of claim 4. As claim 4 has been demonstrated to be patentable over the combination of Hesse and Alft and Hesse, Alft and Bischel then dependent claims 5-12 are likewise patentable. Consequently, the § 103(a) rejection of claims 5-12 must be overturned.

#### IV. CONCLUSION

Appellants respectfully requests the Board overturn the rejections of claims 4-12, under 35 U.S.C. § 103(a), and that a notice of allowance be issued.

Respectfully submitted,



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